

telescope relative to each other while preventing rotation between the parts, resulting in more precise steering control for the rider.

20. (original) A bicycle according to Claim 19, wherein the cross-sectional shape of the stanchion tubes and slider tubes is elliptical and has an aspect ratio of minor to major ellipse axes in the range of seventy (70) to eighty (80) percent.

Remarks

The applicant's invention is directed to use of non-round tubes to prevent rotation between the inner and outer tubes of a telescoping assembly so as to allow the transfer of torque as well as the axial telescoping capability of the assembly. The ability to transfer torque as well as telescope has been practiced before using various approaches in the bicycle industry. A well known bicycle manufacturer has been commercially successful with a system that utilizes a square profile on the outside of the inner tube, and a square profile on the inside of the outer tube, and a series of rolling needle bearings in communication with the flats of the inner tube and the outer tubes' square profiles. This capability allows for a single telescoping assembly, or strut, to be used as a suspension member for the front wheel of a bicycle as it can handle torsion steering loads as well as axial suspension loads. A typical telescoping tube assembly with round inner and outer tubes will spin freely when one of the tubes is given a torque load relative to the other. Therefore, with such construction a single unit cannot be used as a steerable suspension strut. When a pair of round tube telescoping assemblies is used as taught in the Kawahara patent, which has been cited by the Examiner, the wheel axle and the clamps that joint the pair of telescoping tubes to the steering tube of the vehicle frame provides the ability to transfer steering inputs to the wheel. However, when a suspension system utilizing a pair of round tube telescoping assemblies flexes due to the loads seen in vehicle use, the inner and outer tubes can rotate relative to one another. A telescoping assembly such as taught herein prevents this rotation. This eliminates one degree of freedom from the overall suspension system by preventing the rotation of the inner tube relative to the outer tube, which results in a much more precise steering front end of the vehicle. This is the aim and achievement of the invention.

Claims 1-20 are present in the application.

Claim 1 has been amended in order to avoid the rejection thereof under 35 U.S.C. Section 112, second paragraph.

The Examiner has rejected claims 1, 2, 15 and 16 as unpatentable (35 U.S.C. Section 102(b)) over Moore. It is the Examiner's position that "Moore shows a telescoping bicycle suspension including a steering tube 2, a crown 10, stanchion tubes 3, and slider tubes 5. The stanchion slides within the slider tubes and both sets of tubes have a generally elliptical cross-sectional shape (see Figure 3) which does not permit relative rotational movement."

Nothing in the Moore patent, either the written disclosure or the drawings and in particular Figure 3 (as relied on by the Examiner) refers to the shape of the slider or outer tube. The shape of the slider tube cannot be assumed to be elliptical which is what the Examiner has done. To the same effect, there is no basis in the Moore patent to support the Examiner's position that both sets of tubes have a generally elliptical cross-sectional shape . . . which do not permit relative rotational movement. The only references on Moore's part to any kind of relative movement are to sliding movements in the vertical direction rather than a rotational movement in the horizontal direction which is what occurs in the instant application.

Claim 1 of the application recites that "the stanchion tubes and slider tubes have matching mating surface shapes that are non-round, smooth curve . . ." Nothing in Moore discloses this structure and certainly not Figure 3 or that any advantages would flow from such construction.

The Examiner has rejected claims 3-5 and 17 as being unpatentable (35 U.S.C. 103(a)) over Moore in view of Lin.

Moore is not appropriate as a reference, for as has already been pointed out, reliance on Moore is based on an assumption that both sets of tubes have a generally elliptical cross-sectional shape. The reference does not support such teaching.

Lin does not add anything further. The applicant's invention is directed to a front suspension system for steering a front wheel. In complete contrast, Lin teaches a composite bicycle frame containing a hollow slanted-Y-shaped front frame portion, a hollow upper support paw and a hollow lower support paw. The hollow slanted-Y-

shaped front frame portion comprises: (1) a generally common junction; (2) a main tube connected between the front fork assembly of the bicycle and a middle portion of the common junction in a slanted manner; (3) an upper branch tube connected between the seat assembly of the bicycle and an upper portion of the common junction in a slanted manner; and (4) a lower branch tube connected between the pedal support assembly of the bicycle and a lower portion of the common junction in a slanted manner. The hollow upper support paw is connected between the seat assembly and the rear wheel shaft assembly of the bicycle, and the hollow lower support paw connected between the pedal support assembly and the rear wheel shaft assembly. The major portion of the patent's description describes the joining of the various portions of the frame to themselves and to the frame. The Lin construction is a rigid, non-suspended composite bicycle frame. It contains no, and there would be no reason for it to do so, any teaching that would suggest the dimensioning of the Moore tube to have an aspect ratio similar to what is claimed herein. Again, and most importantly, Moore does not suggest or disclose the sliding tube concept of the invention and modification of what is taught in Moore certainly would not result in the telescopic front suspension system of the invention.

The Examiner has rejected claims 1, 2, 6-12, 14-16 and 18-20 under 35 U.S.C. 103(a) as being unpatentable over Kawahara in view of Moore.

The Examiner's position is that "Kawahara shows a bicycle front suspension with an external bushing 26 fixed to the slider 16 and an internal bushing 24B mounted to the lower end of the stanchion, as claimed. The external bushing caps the upper end of the slider and has a tapered internal dimension which provides a graduated cap between the inner surface of the bushing and the external surface of the stanchion." The Examiner admits that Kawahara lacks an elliptical cross section for the stanchion and sliders. Moore is relied on to show this omission.

Again, the Examiner's position is based on the unsupported assumption that Moore teaches that both sets of tubes have elliptical cross-sectional shape. The Examiner states that it would have been obvious to form the Kawahara telescoping members with elliptical cross-sections as taught by Moore in order to make the suspension more aerodynamic and stronger in the direction in which the load is applied. The Examiner

clearly has not appreciated that the instant invention lies in the use of elliptical tube sets in order to prevent relative rotational motion and specifically by using utilizing non-round tubes. The absence of such relative rotational motion gives rise to more precise control of direction provides a fork that steers more precisely than a fork utilizing round tubes in a similar layout, rather than stronger suspension in the direction of load application as in Kawahara. Kawahara's disclosure is related to the damping system contained within a traditional round tube, bushing supported, telescopic fork. His damping invention is basically the ability to control the compression (contraction) damping in one of the telescoping assemblies while controlling rebound (elongation) damping in the other telescoping assembly. He describes the structure of the fork in general terms, as his invention is not directed to a suspension fork system as the applicant has described the damper and spring systems in the instant disclosure in general terms as that is not where the claimed invention is to be found.

The Examiner has stated in paragraph 7 of the office action that claim 13 is allowable if rewritten in independent form. Claim 13 is an independent claim. It is taken that claim 13 is therefore an allowable claim. Claims 14-18 are dependent on claim 13 so that these claims are similarly allowable to the applicant.

It is submitted that in view of the above remarks, all of the claims in the case are allowable and it is respectfully requested that the Examiner so indicate.

Respectfully submitted,

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